



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,168	06/26/2003	Thomas J. McIntyre	BA-00570	8253
22500	7590	02/22/2005	EXAMINER	
BAE SYSTEMS INFORMATION AND ELECTRONIC SYSTEMS INTEGRATION INC. 65 SPIT BROOK ROAD P.O. BOX 868 NHQ1-719 NASHUA, NH 03061-0868			CONNELLY CUSHWA, MICHELLE R	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 02/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

**Office Action Summary**

Application No.

10/608,168

Applicant(s)

MCINTYRE, THOMAS J.

Examiner

Michelle R. Connelly-Cushwa

Art Unit

2874

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 10-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8, 9 and 15-20 is/are rejected.
- 7) ☒ Claim(s) 6 and 7 is/are objected to.
- 8) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>0603</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-9 and 15-20, drawn to an integrated photonic device, classified in class 385, subclass 14.
- II. Claims 10-14, drawn to a process to manufacture an integrated photonic device, classified in class 438, subclass 69.

The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Daniel J. Long on February 10, 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-9 and 15-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 10-14 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Information Disclosure Statement***

The prior art documents submitted by applicant in the Information Disclosure Statement filed on June 26, 2003 have all been considered and made of record (note the attached copy of form PTO-1449).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1-4, 15 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Ide (US 2003/0081922 A1).**

Regarding claims 1, 4 and 15; Figure 9B of Ide discloses an integrated photonic device comprising:

- a substrate (10, 61);
- a photonic circuit/waveguide etched onto the substrate (the photonic circuit including the first core, 62);
- a cladding layer (63) positioned/vertically disposed on the waveguide and substrate, the cladding layer having a refractive index different from the circuit/waveguide; and

- an angled implantation/means to optically connect (68, which is angled at 90 degrees with respect to the substrate) disposed in the cladding layer (63), the angled implantation optically connecting the photonic circuit/waveguide (62) with an outer surface of the cladding layer (63);
- wherein the photonic circuit comprises a waveguide (63).

Applicant is claiming the product including the process of making the photonic circuit/waveguide, and therefor claims 1 and 15 is of "product-by-process" nature. The courts have been holding for quite some time that: the determination of the patentability of product-by-process claim is based on the product itself rather than on the process by which the product is made. *In re Thrope*, 777 F. 2d 695, 227 USPQ 964 (Fed. Cir. 1985); and patentability of claim to a product does not rest merely on a difference in the method by which that product is made. Rather, it is the product itself which must be new and unobvious. Applicant has chosen to claim the invention in the product form. Thus a prior art product which possesses the claimed product characteristics can anticipate or render obvious the claim subject matter regardless of the manner in which it is fabricated. A rejection based on 35 U.S.C. section 102 or alternatively on 35 U.S.C. section 103 of the status is eminently fair and acceptable. *In re Brown and Saffer*, 173 USPQ 685 and 688; *In re Pilkington*, 162 USPQ 147.

As such no weight is given to the process steps recited in claims 1 and 15.

Regarding claims 2, 3 and 20; the substrate comprises an oxide (the first cladding, 61, comprises silicon dioxide) and the second cladding (63) comprises silicon dioxide.

**Claims 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Kuo et al. (US 5,446,814).**

Regarding claims 15-17; Kuo et al. discloses an integrated photonic circuit in Figure 1, comprising:

- a substrate (104);
- a photonic waveguide (113) on the substrate;
- a cladding layer (126) vertically disposed on the waveguide and the substrate, the cladding layer having a refractive index different from the waveguide; and
- means (119, 120) to optically connect the photonic waveguide (113) with an outer surface of the cladding layer (126);
- wherein the means to connect the photonic waveguide with the outer surface forms an angle of about or less than 50 degrees with the substrate (see column 3, lines 3-7).

Applicant is claiming the product including the process of making the waveguide, and therefor claim 15 is of "product-by-process" nature. The courts have been holding for quite some time that: the determination of the patentability of product-by-process claim is based on the product itself rather than on the process by which the product is made. *In re Thrope*, 777 F. 2d 695, 227 USPQ 964 (Fed. Cir. 1985); and patentability of claim to a product does not rest merely on a difference in the method by which that product is made. Rather, it is the product itself which must be new and unobvious. Applicant has chosen to claim the invention in the product form. Thus a prior art

Art Unit: 2874

product which possesses the claimed product characteristics can anticipate or render obvious the claim subject matter regardless of the manner in which it is fabricated. A rejection based on 35 U.S.C. section 102 or alternatively on 35 U.S.C. section 103 of the status is eminently fair and acceptable. *In re Brown and Saffer*, 173 USPQ 685 and 688; *In re Pilkington*, 162 USPQ 147.

As such no weight is given to the process steps recited in claim 15.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 5, 8, 9, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ide (US 2003/0081922 A1).**

Regarding claims 5 and 18; Ide discloses all of the limitations of claim 3, except for specifically teaching that the waveguide comprises SiON. Ide teaches that the substances of each cladding and/or each core are by no means limited to the materials disclosed, and that other materials may be used. SiON is commonly used to form planar optical waveguide structures in the art. Therefore, one of ordinary skill in the art would have been familiar with the practice of forming planar optical waveguides from silicon oxynitride (SiON) and the advantages associated therewith, including the sensitivity of SiON to UV light and properties that allow the material to be selectively

and accurately etched for precise definition of waveguide structures. Thus, one of ordinary skill in the art would have found it obvious to use SiON to form the waveguide in the invention of Ide that is sensitive to UV light and that may be selectively and accurately etched to precisely define the waveguide, since Ide teaches that other materials may be used, and SiON is commonly used in the art to form planar optical waveguide structures.

Regarding claim 8; Ide discloses all of the limitations of claim 8, except for specifically teaching that the angled implantation is formed of SiON. The angled implantation (68) connects the photonic circuit with an outer surface of the cladding layer. SiON is commonly used to form planar optical waveguide structures in the art. Therefore, one of ordinary skill in the art would have been familiar with the practice of forming planar optical waveguides from silicon oxynitride (SiON) and the advantages associated therewith, including the sensitivity of SiON to UV light and properties that allow the material to be selectively and accurately etched for precise definition of the waveguide structures. Thus, one of ordinary skill in the art would have found it obvious to use SiON to for the angled implantation in the invention of Ide that is sensitive to UV light and that may be selectively and accurately etched to precisely define the angled implantation, since Ide teaches that other materials may be used, and SiON is commonly used in the art to form planar optical waveguide structures.

Applicant is claiming the product including the process of making the angled implantation, and therefor claim 8 is of "product-by-process" nature. The courts have been holding for quite some time that: the determination of the patentability of product-



Art Unit: 2874

by-process claim is based on the product itself rather than on the process by which the product is made. *In re Thrope*, 777 F. 2d 695, 227 USPQ 964 (Fed. Cir. 1985); and patentability of claim to a product does not rest merely on a difference in the method by which that product is made. Rather, it is the product itself which must be new and unobvious. Applicant has chosen to claim the invention in the product form. Thus a prior art product which possesses the claimed product characteristics can anticipate or render obvious the claim subject matter regardless of the manner in which it is fabricated. A rejection based on 35 U.S.C. section 102 or alternatively on 35 U.S.C. section 103 of the status is eminently fair and acceptable. *In re Brown and Saffer*, 173 USPQ 685 and 688; *In re Pilkington*, 162 USPQ 147.

As such no weight is given to the process steps recited in claim 8.

Regarding claims 9 and 19; SiON has a refractive index of about 1.6 and SiO<sub>2</sub> has a refractive index of about 1.44.

#### ***Allowable Subject Matter***

**Claims 6 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

The following is a statement of reasons for the indication of allowable subject matter: The prior art cited on attached form PTO-892 is the most relevant prior art known, however, the invention of claims 6 and 7 distinguishes over the prior art of record for the following reasons.

Regarding claim 6; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an integrated photonic device as defined in claim 6, wherein the angled implantation forms an angle of about 50 degrees with the substrate in combination with the limitations of the base claim.

Regarding claim 7; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an integrated photonic device as defined in claim 7, wherein the angled implantation forms an angle less than 50 degrees with the substrate in combination with the limitations of the base claim.

Hence, there is no reason or motivation for one of ordinary skill in the art to use the prior art of record to make the invention of claims 6 and 7.

### ***Conclusion***

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

Application/Control Number: 10/608,168  
Art Unit: 2874

Page 10

*Michelle R. Connelly-Cushwa*  
Michelle R. Connelly-Cushwa  
Patent Examiner  
February 15, 2005